

TCAS II CHANGE PROPOSAL (CP)

DATE: 11 / DEC / 2007

No.: CP118

TCAS II Version: DO-185A (v7) X Other (Specify) _____

MOPS Function Area: Surveillance X Display Req'ts _____ CRS _____
CAS Pseudocode _____ Test Suites _____ Other _____

Priority: URGENT _____ Necessary X Optional _____

CP Type: ERROR _____ Enhancement X Evaluation Request _____
Editorial (Logic) _____ Editorial (Text) _____

Description of Problem/Issue:

Recent data analysis, performed by the William J. Hughes Technical Center, has demonstrated that Dallas does not meet the TCAS II Mode S average density requirement of 0.07 in RTCA/DO-185A. In addition, significant changes in the Chicago and New York areas make them the only places to consider for maximum stressing of TCAS.

Proposed Resolution:

3.4.4.2 Mode S Surveillance Flight Tests

- a. Same
- b. Flight testing shall be accomplished in an area of high Mode S density such as Chicago or New York. Previous tests of TCAS have shown that these areas provide the most stressful environment necessary for evaluation of TCAS Mode S surveillance. Chicago has exhibited a combined air and ground average density of 0.1 and New York 0.12. Chicago has exhibited a maximum NTA of 103 and New York 151. Either Chicago or New York are considered adequate to test the Mode S surveillance, however, New York will provide the most severe combined average density and NTA environment. The most effective flight paths have proven to be orbital flights of 5 nmi radius near the major airport terminal, JFK in New York and O'Hare in Chicago.
- c. The flight test shall be conducted at an altitude less than 10,000 feet during peak traffic periods when the ground visibility is greater than 10 nmi with a ceiling of at least 11,000 feet to ensure the highest peak traffic densities. Other locations may be proposed by the applicant and will be considered as a suitable alternative to the above areas if the applicant can demonstrate that the TCAS surveillance test was conducted in an environment whose combined average density of transponder-equipped aircraft equals or exceeds those of New York or Chicago and indicates a continuous minimum NTA count of 75. Density is defined as the number of other transponder-

equipped aircraft within 10 nmi of the TCAS test aircraft divided by the area of a circle of 10 nmi radius. Thirty-one real aircraft targets occurring simultaneously within 10 nmi of the TCAS test aircraft is equivalent to a density of 0.1 transponder-equipped aircraft per sq nmi. Alternate locations must also contain a minimum of three civil ATC or military secondary surveillance radars located within 30 nmi of the TCAS aircraft in order to provide an interference environment similar to the above areas.

Note: Although New York and Chicago are the highest known densities, future development or test flights may define areas of greater density. If this occurs, for purposes of maximum system stress, the Mode S Surveillance Flight should be flown in these newly defined areas.

- d. Density estimates shall be obtained during a flight test of a minimum duration of 45 minutes. Track analysis data shall be obtained during the 45 minute flight and will contain an accumulation of 5,000 to 8,000 seconds of target track reports on targets-of-interest. More than 8,000 track seconds need not be analyzed. However, an aircraft density estimate for at least 45 minutes shall be provided. A target-of-interest is defined as any target-of-opportunity that is:
 1. Within 10 nmi of TCAS
 2. Within +/- 10 degrees elevation of TCAS, and
 3. Altitude reporting and airborne

It is expected that the applicant will have prior knowledge of the density conditions in the flight area and will select the flight time that will provide the maximum density.

- e. Delete narrative
- f. Becomes e. Same, except changing “g” to “f” in second sentence.
- g. Becomes f. Same
- h. Becomes g. Same

Requester: Surveillance Working Group

Organization: RTCA-SC147

DISPOSITION OF CHANGE PROPOSAL (Per RWG):

DATE OF DISPOSITION 11 / DEC / 2007

Rejected **Deferred** **[Review Date:** / / **]**

Accepted X **Modified** **Withdrawn**

DISPOSITION OF CHANGE:

On Hold **Designing** **Testing** **Done** X **[Date:** 11 / DEC / 2007 **]**

Final Approval of Changes:

Signature: Andy Zeitlin, RWG Chair

Date: 11 / DEC / 2007